

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A windshield heated liquid spray assembly comprising:

a liquid heating assembly; and

a heated liquid spray assembly operative to spray heated liquid onto a windshield,

said liquid heating assembly comprising:

a liquid heating chamber comprising a substantially cylindrical outer sleeve disposed about a longitudinal axis;

at least one heating element disposed in said liquid heating chamber; and

at least one heat dissipator disposed in said liquid heating chamber in heat conduction contact with said at least one heating element, said at least one heat dissipator having at least one wall at least partially defining at least one substantially linear liquid flow channel parallel to said longitudinal axis and having first and second open ends, said at least one heat dissipator being operative to transfer heat from said at least one heating element to ~~said~~ liquid flowing through said at least one liquid flow channel,

whereby liquid flows within the at least one liquid flow channel primarily in one direction with respect to the longitudinal axis, from the liquid heating chamber into the first open end to the second open end and into the liquid heating

chamber, through convection as heat is transferred to the liquid by the at least one heat dissipator.

2. (Original) A windshield heated liquid spray assembly according to claim 1 and also comprising a liquid temperature sensor operative to sense a temperature of liquid heated by said liquid heating assembly and wherein said at least one heat dissipator is configured and operative to enhance homogeneity of heating of said liquid in said liquid heating chamber, whereby said temperature sensed by said liquid temperature sensor is generally representative of the temperature of said liquid within said liquid heating chamber.

3. (Currently Amended) A windshield heated liquid spray assembly according to claim 1 and wherein the at least one wall of said at least one heat dissipator is configured to be non-uniform in thickness ~~along at least one dimension~~ said longitudinal axis of said liquid heating chamber.

4. (Canceled)

5. (Currently Amended) A windshield heated liquid spray assembly according to claim 1 and wherein said at least one heat dissipator includes at least one aperture through the at least one wall communicating with said at least one liquid flow channel.

6. (Currently Amended) A windshield heated liquid spray assembly according to claim ~~1~~30 and wherein ~~said at least one heat dissipator is located within said liquid heating chamber to define at least one~~ a first fluid flow gap is formed between the first open end of the at least one heat dissipator and the liquid heating chamber base, and a second fluid flow gap is formed between the second open end of the at least one heat dissipator and the liquid heating chamber upper surface, whereby heated liquid circulates by convection primarily out the second open end into the second fluid flow gap, between the at least one heat dissipator and the liquid heating chamber cylindrical sleeve, and through the first fluid flow gap into the first open end.

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Withdrawn) A windshield heated liquid spray assembly comprising:

a liquid heating assembly; and

a heated liquid spray assembly operative to spray heated liquid onto a windshield,

said liquid heating assembly comprising:

a liquid heating chamber;

at least one heating element disposed in said liquid heating chamber; and

an electrical power supply connection to said at least one heating element, said electrical power supply connection including a meltable conductor portion in heat conductive contact with said liquid heating chamber and being operative to melt, and thus interrupt supply of electrical power to said at least one heating element in response to heating of liquid in said liquid heating chamber above a predetermined temperature.

11. (Withdrawn) A windshield heated liquid spray assembly according to claim 10 and also comprising at least one heat dissipator in heat conduction contact with said at least one heating element, said at least one heat dissipator at least partially defining at least one liquid flow channel and being operative to transfer heat from said at least one heating element to said liquid flowing through said at least one liquid flow channel.

12. (Withdrawn) A windshield heated liquid spray assembly according to claim 11 and also comprising a liquid temperature sensor operative to sense a temperature of liquid heated by said liquid heating assembly and wherein said at least one heat

dissipator is configured and operative to enhance homogeneity of heating of said liquid in said liquid heating chamber, whereby said temperature sensed by said liquid temperature sensor is generally representative of the temperature of said liquid within said liquid heating chamber.

13. (Withdrawn) A windshield heated liquid spray assembly according to claim 11 and wherein said at least one heat dissipator is configured to be non-uniform along at least one dimension of said liquid heating chamber.

14. (Withdrawn) A windshield heated liquid spray assembly according to claim 11 and wherein said at least one heat dissipator is configured to extend along a longitudinal axis, which is intended to be aligned vertically and is non-uniform along said longitudinal axis, thereby to enhance homogeneity of heating of said liquid therealong.

15. (Withdrawn) A windshield heated liquid spray assembly according to claim 11 and wherein said at least one heat dissipator includes at least one aperture communicating with said at least one liquid flow channel.

16. (Withdrawn) A windshield heated liquid spray assembly comprising:

a liquid heating assembly; and  
a heated liquid spray assembly operative to spray heated liquid onto a windshield,  
said liquid heating assembly comprising:  
a liquid heating chamber;  
at least one heating element disposed in said liquid heating chamber; and  
a liquid supply assembly coupled to said liquid heating chamber and including:  
a valve operative to allow liquid flow into said liquid heating chamber and to impede backflow from said liquid heating chamber; and  
at least one bypass conduit, user selectably operative to allow said backflow to bypass said valve.

17. (Withdrawn) A windshield heated liquid spray assembly comprising:

a liquid heating assembly including;  
a liquid heating chamber; and  
at least one heating element disposed in said liquid heating chamber;  
a liquid temperature sensor operative to sense a temperature of liquid heated by said liquid heating assembly;  
a heated liquid spray assembly operative to spray said heated liquid onto a windshield; and

a controller operative to control operation of said spray assembly in accordance with said temperature sensed by said liquid temperature sensor, said controller providing at least one first spray instance beginning when said liquid temperature is at a first temperature and terminating when said liquid temperature is at a second temperature, below said first temperature, and at least one second spray instance terminating when said liquid temperature is at a third temperature, below said second temperature.

18. (Withdrawn) A windshield heated liquid spray assembly according to claim 17 and also comprising a temperature sensor operative to sense an ambient temperature outside of said liquid heating assembly and wherein said third temperature is determined by said controller based on said ambient temperature.

19. (Withdrawn) A windshield heated liquid spray assembly according to claim 17 and wherein said controller is operative to terminate said at least one first spray instance if said second temperature is not reached within a predetermined time.

20. (Withdrawn) A windshield heated liquid spray assembly according to claim 17 and wherein said controller is operative to terminate said at least one second spray instance if said third temperature is not reached within a predetermined time.

21. (Withdrawn) A windshield heated liquid spray assembly according to claim 17 and wherein said at least one second spray instance begins when said liquid temperature is at said first temperature.

22. (Withdrawn) A windshield heated liquid spray assembly according to claim 17 and wherein said liquid heating assembly also includes an electrical power supply connection to said at least one heating element, said electrical power supply connection including a meltable conductor portion in heat conductive contact with said liquid heating chamber and being operative to melt, and thus interrupt supply of electrical power to said at least one heating element in response to heating of liquid in said liquid heating chamber above a predetermined temperature.

23. (Withdrawn) A windshield heated liquid spray assembly according to claim 17 and also comprising at least one heat dissipator in heat conduction contact with said at least one heating element, said at least one heat dissipator at least partially defining at least one liquid flow channel and being operative to transfer heat from said at least one heating element to said liquid flowing through said at least one liquid flow channel.



24. (Withdrawn) A windshield heated liquid spray assembly according to claim 23 and also comprising a liquid temperature sensor operative to sense a temperature of liquid heated by said liquid heating assembly and wherein said at least one heat dissipator is configured and operative to enhance homogeneity of heating of said liquid in said liquid heating chamber, whereby said temperature sensed by said liquid temperature sensor is generally representative of the temperature of said liquid within said liquid heating chamber.

25. (Withdrawn) A windshield heated liquid spray assembly according to claim 23 and wherein said at least one heat dissipator is configured to be non-uniform along at least one dimension of said liquid heating chamber.

26. (Withdrawn) A windshield heated liquid spray assembly according to claim 23 and wherein said at least one heat dissipator is configured to extend along a longitudinal axis, which is intended to be aligned vertically and is non-uniform along said longitudinal axis, thereby to enhance homogeneity of heating of said liquid therealong.

27. (Withdrawn) A windshield heated liquid spray assembly according to claim 23 and wherein said at least one heat

dissipator includes at least one aperture communicating with said at least one liquid flow channel.

28. (Withdrawn) A method for spraying heated liquid onto a windshield comprising:

providing a liquid heating assembly including a liquid heating chamber, at least one heating element disposed in said liquid heating chamber and at least one heat dissipator in heat conduction contact with said at least one heating element, said at least one heat dissipator at least partially defining at least one liquid flow channel;

heating said at least one heating element;

transferring heat from said at least one heating element to liquid flowing through said at least one liquid flow channel; and

spraying said liquid heated by said liquid heating assembly onto a windshield.

29. (Withdrawn) A method for spraying heated liquid onto a windshield comprising:

providing a liquid heating assembly including a liquid temperature sensor;

heating a liquid in said liquid heating assembly until a first spray cycle start temperature is sensed by said liquid temperature sensor;

beginning at least one first spray instance when said first spray cycle start temperature is sensed by said liquid temperature sensor;

terminating said first spray instance when a first spray cycle end temperature is sensed by said liquid temperature sensor; said first spray cycle end temperature being below said first spray cycle start temperature;

subsequently beginning at least one second spray instance when a second spray cycle start temperature is sensed by said liquid temperature sensor; and

terminating said second spray instance when a second spray cycle end temperature is sensed by said liquid temperature sensor, said second spray cycle end temperature being below said first spray cycle end temperature.

30. (New) A windshield heated liquid spray assembly according to claim 1 and wherein the liquid heating chamber further comprises a base connected to a first end of the cylindrical outer sleeve and an upper surface connected to a second end of the cylindrical outer sleeve.